

Appl. No. 10/724,863
Response Dated May 15, 2006
Reply to Office Action of February 15, 2006

Amendments to the Specification

Please add new paragraphs 12 and 13 to the specification as follows:

[0012] FIG. 10, illustrates a diagram of a first level store queue comprising an n-entry circular buffer holding the last n stores in the instruction window with head and tail pointers, an address matching circuit, and a store select circuit, according to embodiments of the present inventions.

[0013] FIG. 11, illustrates a diagram of a second level circuit comprising a memory dependence predictor and an unresolved address buffer, according to embodiments of the present inventions.

Please amend original paragraphs 16, 17, 27, 28, 29, and 55 as follows:

[0016] In many embodiments of the present invention, the L1 STQ may be utilized as the principle store queue. The L1 STQ may be a small n-entry buffer holding the last n stores in the instruction window. This buffer may be designed as a circular buffer with head and tail pointers. According to some embodiments, when a new store is inserted into the instruction window, an entry may be allocated for the store at the tail of the L1 STQ. The L1 STQ, in order to prevent stalling when it is full, may remove the previous store from the head of the queue to make space for the new store. The previous store may either be moved into a backing L2 CT, according to some embodiments of the present invention, or into a speculative data cache, according to other embodiments of the present invention.

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The L1 STQ may have the necessary address matching and store select circuit to forward data to any dependent loads. (See FIG. 10, for example.)

[0017] With respect to FIG. 1, a diagram of a store queue with a second level circuit is shown, according to an embodiment of the present invention. In this diagram, hierarchical store queue 100 is shown to include at least, but not limited to, a L1 STQ 102 coupled to a L2 CT 104. Both elements 102 and 104 are capable of receiving stores independently. L2 CT 104 is further capable of receiving stores from the L1 STQ 102. The L1 STQ 102 may include address matching and store select circuit to forward data to any dependent loads. Stores may be processed through multiplexer (MUX) 106, which has selectivity control, as illustrated in the sideways (horizontal) intersecting line from the L1 STQ 102. (See FIG. 10, for example.)

[0027] According to the above embodiments, the present invention may include a first level store queue 102 adapted to store in an n-entry buffer the last n stores in an instruction window; and a second level circuit 104 adapted to accept and buffer non-retired stores from the first level store queue 102. The first level store queue 102 further includes an address matching circuit; and a store select circuit, where both circuits may forward stores and store data to dependent loads. (See FIG. 10, for example.)

[0028] As one of ordinary skill in the art would realize, based at least on the teaching provided herein, the first level store queue 102 may be a circular buffer with head and tail pointers. (See FIG. 10, for example.)